IN THE CLAIMS

Please amend claims 1 and 4 as follows:

1. (currently amended) A method for drilling a subterranean formation comprising the steps of:

rotating a housing for driving a ~~shearing~~ drill bit at a rotational speed at least equal to a rotational speed of the housing so as to drill the formation;

storing potential energy, and

periodically imparting the potential energy into the drill bit for periodically driving the drill bit at a rotational speed greater than that of the housing and increasing drilling torque.

2. (previously amended) The method of claim 1 wherein the storing and releasing of the potential energy comprises the steps of:

rotating an inertial hammer to store potential energy; and

periodically impacting the rotating inertial hammer with a rotary anvil on the drill bit to impart the stored potential energy to the drill bit.

3. (previously amended) The method of claim 2 wherein the rotary impact is only imparted to the drill bit when the drill bit bears against the formation.

4. (currently amended) A method for drilling a subterranean formation with a PDC drill bit depending from a drill string, the method comprising the steps of:

providing an assembly adjacent the drill bit;

rotating the assembly to rotate the drill bit at a rotational speed at least equal to a rotational speed of the assembly; ~~and~~

rotating a hammer to store potential energy in the assembly; and

periodically impacting the rotating hammer with an anvil on the drill bit so as to impart the stored potential energy to the drill bit for periodically driving the drill bit at a rotational speed greater than that of the housing and increasing drilling torque.

5. (original) The method as described in claim 4 wherein the hammer is rotated using drilling fluid.

6. (previously amended) A rotational impact assembly for a drill bit comprising:

a housing adapted to be rotated by a first rotary drive;

a drill bit extending from the rotating housing for co-rotation at a rotational speed at least equal to a rotational speed of the housing; and

a second rotary drive located in the housing for periodically and rotatably impacting the drill bit to increase drilling torque.

7. (previously cancelled).

8. (previously amended) The rotational impact assembly of claim 6 further comprising a bit shaft through which the drill bit is rotatably driven, the drill bit being adapted for limited rotation relative to the housing so that when rotationally impacted, the bit shaft receives the energy substantially independent of the housing whereby the drill bit receives substantially all energy from the rotary impact.

9. (previously amended) The rotational impact assembly of claim 6 wherein the second rotary drive is a motor driven by drilling fluids.

10. (previously amended) The rotational impact assembly of claim 6 wherein the first rotary drive is a rotating end of the drill string.

11. (original) The rotational impact assembly of claim 9 wherein the motor is a turbine.

12. (original) The rotational impact assembly of claim 9 further wherein the motor comprises a stator shaft having a first downhole position and in which a frictional interface is engaged between the stator shaft and the housing to prevent operation of the motor, and a second uphole position in which the frictional interface is disengaged for permitting operation of the motor.

13. (previously amended) A rotational impact assembly for a drill bit comprising:

a housing adapted to be rotated by a first rotary drive, the housing having a bore;

a motor located in the bore for rotating a stator shaft;

a bit shaft extending from the bore of the housing and being adapted at a downhole end for rotatably driving the drill bit;

means for normally driving the drill bit with the housing at a rotational speed at least equal to a rotational speed of the housing; and

means for periodically coupling the stator shaft and bit shaft for co-rotation whereby rotational energy is transferred from the stator shaft to the bit shaft for increasing drilling torque.

14. (original) The rotational impact assembly of claim 13 wherein the coupling means comprise:

an annular mass rotated by the stator shaft and having a radially extending hammer; and

an anvil extending radially from the bit shaft and adapted to be impacted by the hammer.

15. (original) The rotational impact assembly of claim 14 further comprising:

a carrier driven by th stator shaft and in which the annular mass is carried about the bit shaft;

means for alternating the position of the annular mass between concentric and eccentric positions about the bit shaft upon each rotation of the stator shaft, the carrier and annular mass being rotated concentrically so as to cause the hammer and anvil to couple, and the annular mass then moving eccentrically so as to decouple the hammer from the anvil.

16. (original) The rotational impact assembly of claim 15 wherein the means for alternating the annular mass position comprises:

a first pin affixed in the carrier and at a tangent of the annular mass for enabling the annular mass to pivot eccentrically;

a second pin affixed in the carrier diametrically opposed to the first pin and at a tangent of the annular mass, the annular mass having circumferentially elongated notch formed in its tangent for permitting limited the eccentric movement of the annular mass, the eccentric movement being sufficient to decouple the hammer and anvil.

17. (previously cancelled)

18. (previously amended) The rotational impact assembly of claim 14 further comprising:

a carrier driven by the stator shaft for carrying the annular mass about the bit shaft; and

an offset pin in the carrier about which the annular mass can pivot between concentric and eccentric positions about the bit shaft so that upon each rotation of the stator shaft, the carrier and annular mass are rotated concentrically so as to cause the hammer and anvil to couple after which the annular mass pivots to the eccentric position so as to decouple the hammer from the anvil.

19. (original) The rotational impact assembly of claim 18 further comprising a second pin in the carrier and diametrically opposed to the first offset pin, the annular mass having circumferentially spaced stops which alternately position the annular mass between the concentric and eccentric positions.

20. (previously amended) The rotational impact assembly of claim 14 wherein the motor is rotated by drilling fluids flowing to the drilling bit.

21. (previously added) A rotational impact assembly for a drill bit comprising:

a housing adapted to be rotated by a rotary drive;

a bit extending from the housing and being rotatably driven thereby; and

a motor located in the housing, driven by drilling fluids and comprises a stator shaft having a first downhole position and in which a frictional interface is engaged between the stator shaft and the housing to prevent operation of the motor, and a second uphole position in which the frictional interface is disengaged for permitting operation of the motor, for periodically and rotatably impacting the drill bit.

22. (previously added) The method of claim 1 further comprising:

rotating a motor in the housing to store potential energy;

rotating a inertial hammer with the motor; and

periodically impacting the rotating hammer with an anvil on the drill bit.

23. (previously added) The method of claim 22 further comprising providing drilling fluid through the housing to drive the motor.

24. (previously added) The method of claim 22 further comprising flowing drilling fluids to the drilling bit for driving the motor.

25. (previously added) The method of claim 22 further comprising:

rotating the motor while the drill bit is drilling for performing the storing of potential energy and periodically imparting the stored potential energy into the drill bit; and

braking the motor while the drill bit is not drilling.

26. (previously added) The rotational impact assembly of claim 13 comprising means positioned between the housing and the drill bit for permitting limited rotation therebetween so that the drill bit, when impacted, receives substantially all rotational energy from the rotary impact.

27. (previously added) The rotational impact assembly of claim 26 wherein the rotation limiting means comprises cooperating castellation between the housing and the drill bit.